

Industrial Device Server User's Manual

MS655400X



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Getting to Know Your Device Server

1.1 About the MS655400X Serial Device Server

MS655400X is an innovative 1 port RS232/422/485 to 2 ports LAN redundant device server. To assure the agility and security of critical data, MS655400X offers many powerful features for HW & SW redundant functions. When the connection between master-link and LAN fails, the MS655400X can automatically switch to another LAN port within 10mS, and still guarantees a non-stop connection.

MS655400X also supports switch mode, you can use Daisy Chain to reduce the usage of Ethernet switch ports. Secondly, the MS655400X can simultaneously transfer data into 5 host PCs. This feature can assure all critical data that saved in different host PC to avoid Ethernet break or host PCs failure. MS655400X also Support the data encryption with SSL, so it can assure the data transfer safely.

Thirdly, the MS655400X provides dual redundant power inputs on DC power jack and terminal block. MS655400X also provides NAT pass through function so that you are able to manage MS655400X inside or outside the NAT router. It is easy for different IP domain to use MS655400X. You can configure and manage the device server easily by using the windows management tool (VCOM). Therefore, MS655400X is the best communication redundant solution for current application of serial devices

1.2 Software Features

- Redundant Dual Ethernet Ports: Recovery time < 10mS
- Switch Mode Supported: Daisy Chain support to reduce usage of switch ports
- NAT-pass through: User can manage MS655400X through NAT router
- PPPoE for internet connection.
- Data Encryption with SSL for Security data transfer.
- DDNS for domain name service.
- Redundant Power Inputs: 12~48VDC on power jack and terminal block

- Redundant multiple host devices: 5 simultaneous in Virtual COM, TCP Server, TCP Client mode, UDP
- Secured Management by HTTPS and SSH,
- Versatile Modes: Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP
- Event Warning by Syslog, Email, SNMP trap, and Beeper
- Various Windows O.S. supported: Windows NT/2000/ XP/ 2003/VISTA

1.3 Hardware Features

- Redundant Power Inputs: 12~48 VDC on terminal block and power jack
- Operating Temperature: -10 to 60°C
- Storage Temperature: -40 to 85°C
- Operating Humidity: 5% to 95%, non-condensing
- Casing: IP-30
- 2 10/100Base-T(X) Ethernet port
- Dimensions(W x D x H) : 72mm(W)x125 mm(D)x31mm(H)

Hardware Installation

2.1 Install MS655400X on DIN-Rail

Each MS655400X has a Din-Rail kit on rear panel. The Din-Rail kit helps MS655400X to fix on the Din-Rail. It is easy to install the MS655400X on the Din-Rail:

2.1.1 Mount MS655400X on DIN-Rail

Step 1: Slant the MS655400X and mount the metal spring to Din-Rail.

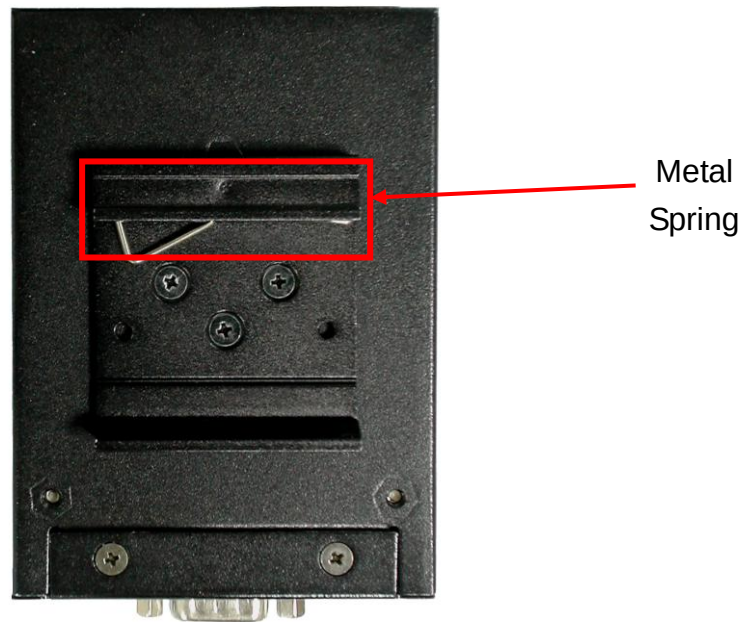


Figure 2-1

Step 2: Push the MS655400X toward the Din-Rail until you heard a “click” sound.



Figure 2-2

2.2 Wall Mounting Installation

Each MS655400X has another installation method for you. A wall mount panel can be found in the package. The following steps show how to mount the MS655400X on the wall:

2.2.1 Mount MS655400X on wall

Step 1: Remove Din-Rail kit.

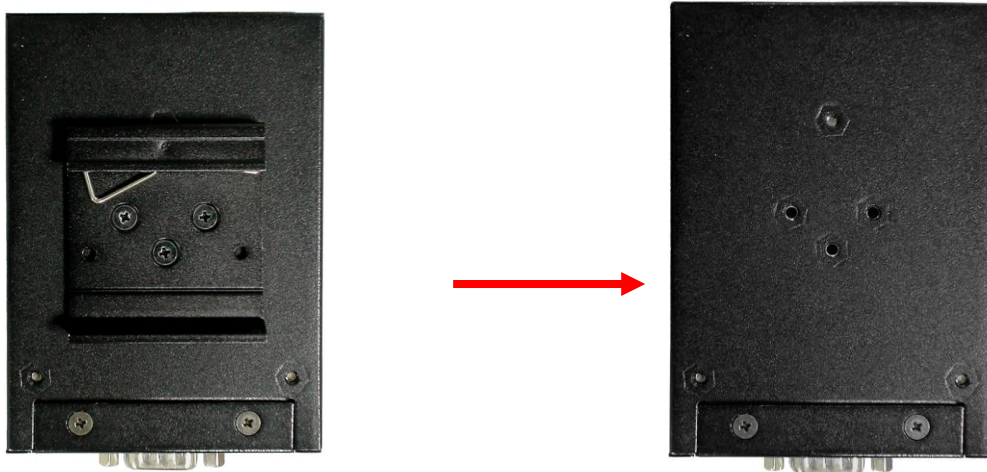


Figure 2-3

Step 2: Use 6 screws that can be found in the package to combine the wall mount panel. Just like the picture shows below:



Figure 2-4

The screws specification shows in the following two pictures. In order to prevent MS655400X from any damage, the size of screws should not be larger than the size that used in MS655400X.

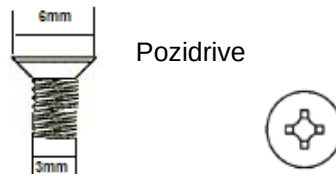


Figure 2-5

Hardware Overview

3.1 Front Panel



Figure 3-1

1. Product description of MS655400X.
2. LED for PWR1 and system status. When the PWR1 links, the green led will be light on.
3. LED for PWR2 and system status. When the PWR2 links, the green led will be

light on.

4. LED of 10/100Base-T(X) Ethernet port 1.

5. LED of 10/100Base-T(X) Ethernet port 2.

6. LED of serial port. Green for transmitting, red for receiving

3.2 Front Panel LEDS

The following table describes the labels that stick on the MS655400X.

LED	Color	Status	Description
PWR1	Green/Red	On	DC power 1 activated.
		Red blinking	Indicates an IP conflict, or DHCP or BOOTP server did not respond properly
PWR2	Green/Red	On	DC power 2 activated.
		Red blinking	Indicates an IP conflict, or DHCP or BOOTP server did not respond properly
ETH1	Green/Amber	Green On/Blinking	100Mbps LNK/ACT
		Amber On/Blinking	10Mbps LNK/ACT
ETH2	Green/Amber	Green On/Blinking	100Mbps LNK/ACT
		Amber On/Blinking	10Mbps LNK/ACT
Serial	Green	Blinking	Serial port is transmitting data
	Red	Blinking	Serial port is receiving data

Table 3-1 Front panel LEDs

3.3 Top Panel

The Top panel components of MS655400X are shown as below:

1. Terminal block include: PWR1 (12 ~ 48V DC)
2. Power Jack include: PWR2 (12 ~ 48V DC)
3. RJ45 Ethernet Connector: 2 10/100Base-T(X) Ethernet interface.

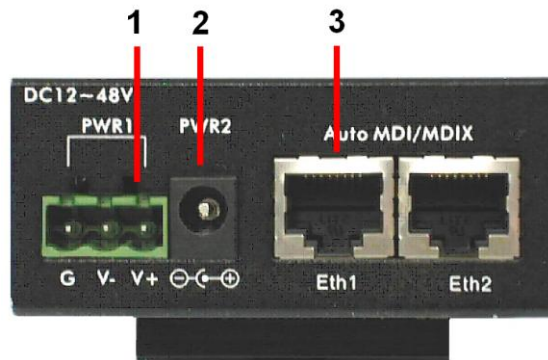


Figure 3-2

3.4 Bottom Panel

The bottom panel components of MS655400X are shown as below:

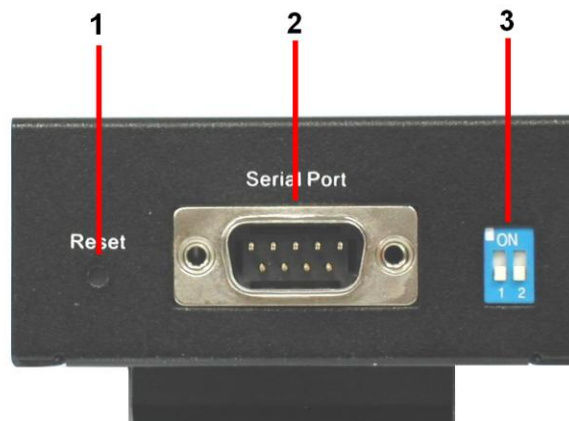
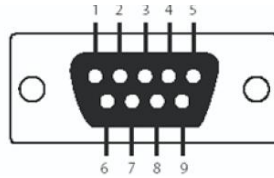


Figure 3-3

1. Reset button. 5 seconds for factory default.
2. Male DB9 connector: Serial interface of RS-232/422/485 (2 wire)(4 wire).

DB9 connector



Pin #	RS 232	RS 422	RS 485 (4 wire)	RS 485 (2 wire)
1	DCD	RXD -	RXD -	
2	RXD	RXD +	RXD +	
3	TXD	TXD +	TXD +	DATA +
4	DTR	TXD -	TXD -	DATA -
5	GND	GND	GND	GND
6	DSR			
7	RTS			
8	CTS			
9	RI			
RS 232 mod act as DTE				

Table 3-2 Pin assignment

3. DIP Switch: Termination for RS-422/485

DIP 1	DIP 2	Termination Configuration
ON	ON	Termination for long distance 4-wire RS485/422
ON	OFF	Reserved
OFF	ON	Termination for long distance 2-wire RS485
OFF	OFF	No termination for RS485/ 422 (short distance)

Table 3-2 DIP Switch

3.5 Rear Panel

The rear panel components of MS655400X are shown as below:

1. Screw holes for wall mount kit and DIN-Rail kit.
2. Din-Rail kit
3. Wall Mount kit.

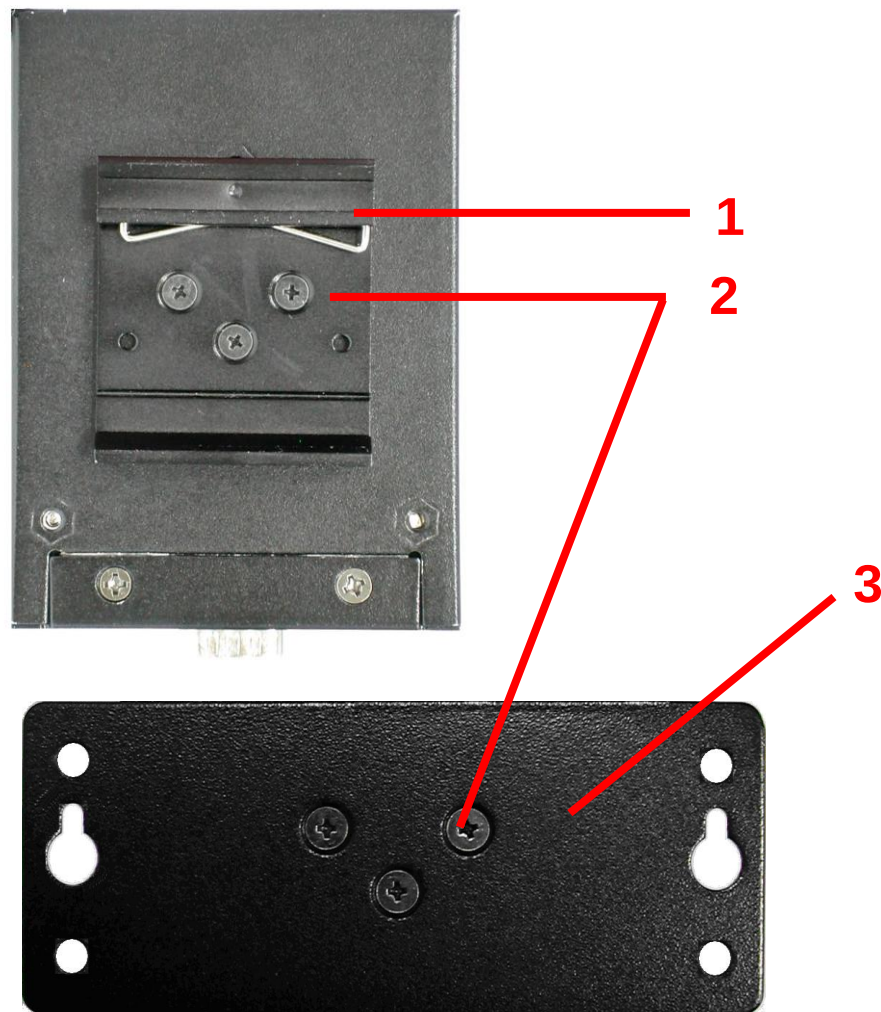


Figure 3-4 Rear Panel

Cables

4.1 Ethernet Cables

The MS655400X has standard Ethernet ports. According to the link type, the MS655400X use CAT 3, 4, 5,5e UTP cables to connect to any other network device (PCs, servers, switches, routers, or hubs). Please refer to the following table for cable specifications.

Cable	Type	Max. Length	Connector
10BASE-T	Cat. 3, 4, 5 100-ohm	UTP 100 m (328 ft)	RJ-45
100BASE-TX	Cat. 5 100-ohm UTP	UTP 100 m (328 ft)	RJ-45

Table 4-1 Cable Types and Specifications

100BASE-TX/10BASE-T Pin Assignments

With 100BASE-TX/10BASE-T cable, pins 1 and 2 are used for transmitting data, and pins 3 and 6 are used for receiving data.

Pin Number	Assignment
1	TD+
2	TD-
3	RD+
4	Not used
5	Not used
6	RD-
7	Not used
8	Not used

Table 4-2 RJ-45 Pin Assignments

MICROSENS

The MS655400X supports auto MDI/MDI-X operation. You can use a straight-through cable to connect PC to MS655400X. The following table below shows the 10BASE-T/ 100BASE-TX MDI and MDI-X port pin outs.

Pin Number	MDI port	MDI-X port
1	TD+(transmit)	RD+(receive)
2	TD-(transmit)	RD-(receive)
3	RD+(receive)	TD+(transmit)
4	Not used	Not used
5	Not used	Not used
6	RD-(receive)	TD-(transmit)
7	Not used	Not used
8	Not used	Not used

Table 4-2 MDI / MDI-X pins assignment

Note: "+" and "-" signs represent the polarity of the wires that make up each wire pair.

Management Interface

5.1 VCOM

VCOM is a powerful Windows utility for DS series. It supports device discovery, device configuration, group setup, group firmware update, monitoring functions...etc. It is easy for you to install and configure devices over the network.

5.1.1 Install IVCOM

Step 1: Execute the Setup program, click "**start**" after selecting the folder for VCOM.

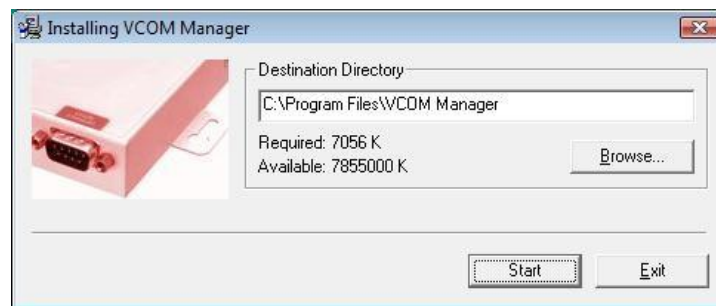


Figure 5-1

Step 2: When installation complete successfully, then click "OK".

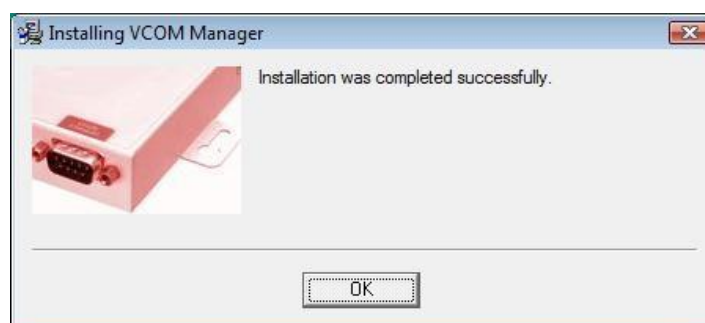


Figure 5-2

Step 3: Check for your selection.

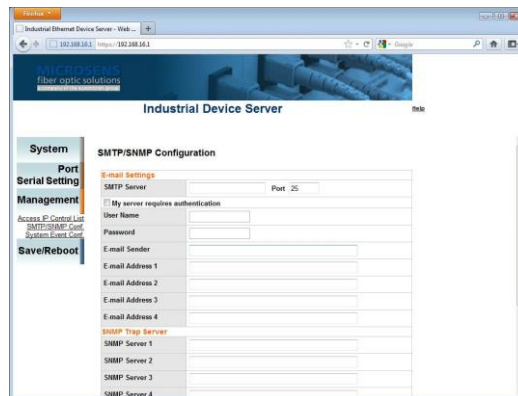


Figure 5-3

5.1.2 Using VCOM

5.1.2.1 Explore device servers

VCOM will broadcast to the network and search all available DS devices in the network. The default IP address of device is "**192.168.16.1**", and selects the searching device you wish to use and press "**Add**" button.

You can set static IP address or in DHCP client mode to get IP address automatically. Finally, click "**OK**" button to add the device.

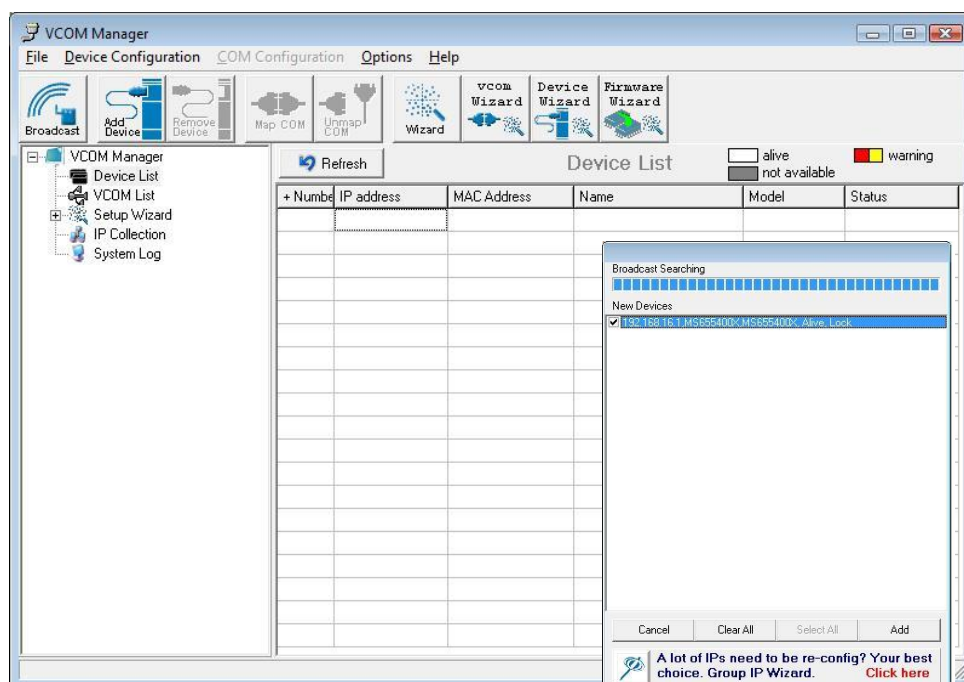


Figure 5-4a

5.1.2.2 Configure device servers

General settings

This page includes the setting of device name, SNTP server and Auto IP Report.

Figure 5-5 General settings

The following table describes the labels in this screen.

Label	Description
Device Name/location	You can set the device name or related information. By clicking "Locate On" button you can locate the serial server's position.
Set SNTP	Input the SNTP server domain name or IP address, port and select the Time zone.
Set Auto IP Report	By Clicking the " Get current Host " button you will get your local IP, and then set the Report interval time. The device server will report its status periodically.

Table 5-1 General settings

At IP collection option show the device server status. The report interval is 0 indicate disable this setting (default). But you can set the other IP or Port.

Security

GeneralSecurityNetworkingDDNSNotificationManagementUpgrade FirmwareSave/Load

Access IP Table

IP1

Mask

☐ Enabled

IP2

Mask

☐ Enabled

IP3

Mask

☐ Enabled

IP4

Mask

☐ Enabled

IP5

Mask

☐ Enabled

IP6

Mask

☐ Enabled

IP7

Mask

☐ Enabled

IP8

Mask

☐ Enabled

IP9

Mask

☐ Enabled

IP10

Mask

☐ Enabled

IP11

Mask

☐ Enabled

IP12

Mask

☐ Enabled

IP13

Mask

☐ Enabled

IP14

Mask

☐ Enabled

IP15

Mask

☐ Enabled

IP16

Mask

☐ Enabled

Password

New Password

Confirm New Password

Old Password

Change Password

Refresh

Apply Only

Apply and Save

Figure 5-6 Security

The following table describes the labels in this screen.

Label	Description
Accessible IP Setting	To prevent unauthorized access by setting host IP addresses and network masks.
Password setting	You can set the password to prevent unauthorized access from your server. Factory default is no password.

Table 5-2 Security

Network Setting

Device can connect the Network by wire. You must assign a valid IP address for DS before attached in your network environment. Your network administrator should provide you the IP address and related settings. The IP address must be unique within the network (otherwise, DS will not have a valid connection to the network). You can choose from three possible **“IP configuration”** modes: Static, DHCP/BOOTP. The Factory Default IP address is **“192.168.16.1”**

Figure 5-7 Network Setting

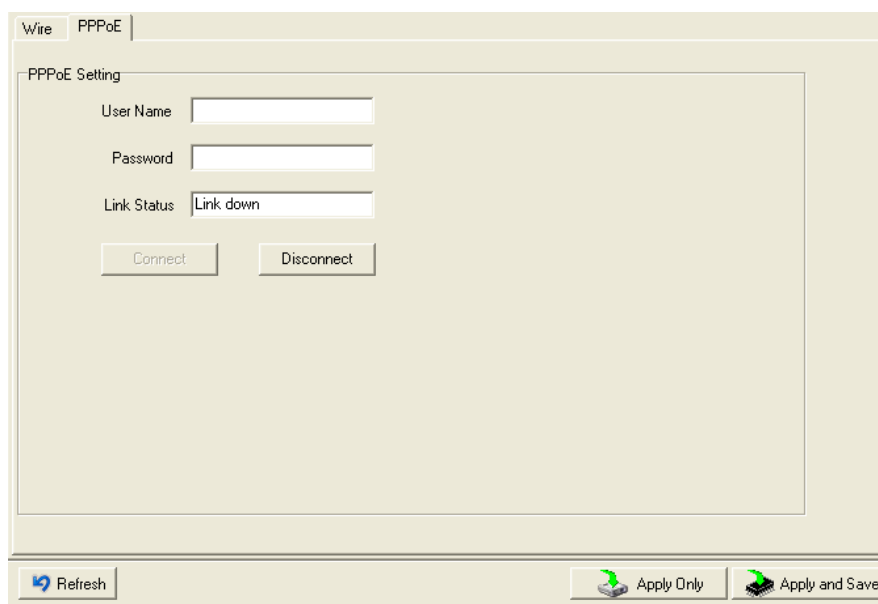
The following table describes the labels in this screen.

Label	Description
Using DHCP/BOOTP	IP Address automatically assigned by a DHCP server in your network.
Static IP Address	Manually assigning an IP address.
Subnet Mask	All devices on the network must have the same subnet mask to communicate on the network.
Gateway	Enter the IP address of the router in you network.
DNS Server	Enter the IP address of the DNS server, The DNS server translates domain names into IP address.
Switch Mode	Redundant: When the connection between master-link and LAN fails, the DS can automatically switch to another LAN port within10mS, and still guarantees a non-stop connection Switch: Daisy Chain support to reduce usage of switch ports.

Table 5-3 Network setting

PPPoE

PPPoE (Point-to-Point Protocol over Ethernet), Device can use PPPoE mode to connect the Network. Input the **"username"** and **"Password"**, then click **"Connect"** button. If the device has been connected, the **"Link Status"** will become the "Link up" and device will get an IP address from PPPoE server. Click **"Disconnect"** button to disconnect the PPPoE connection.



Wire PPPoE

PPPoE Setting

User Name

Password

Link Status

Figure 5-8 PPPoE Setting

DDNS

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname, allowing your computer to be more easily accessed from various locations on the Internet.

Figure 5-10 DDNS Setting

The following table describes the labels in this screen.

Label	Description
Service Provider	Choose the DDNS service Provider
Hostname	You must first apply an account from the DDNS service Provider such as www.dyndns.org, then register with the dynamic DNS service. Input the fixed hostname you got from the DDNS service.
Account and Password	Input the Account and Password you have registered from the DDNS service Provider.

Table 5-4 DDNS setting

Notification

Specify the events that should be notified to the administrator. The events can be alarmed by E-mail, SNMP trap, or system log.

The screenshot shows the 'Notification' tab in the Microsens web interface. At the top, there are tabs for General, Security, Networking, DDNS, Notification (selected), Management, Upgrade Firmware, and Save/Load. Below the tabs, there are three checkboxes: 'SNMP Trap' (unchecked), 'Email Notification' (unchecked), and 'Syslog Notification' (checked). Under the 'Syslog Settings' sub-tab, there is a 'Notified Items' section with a list of events, each with a checkbox. The events are: Hardware Reset (Cold Start), Software Reset (Warm Start), Login Failed, IP Changed, Password Changed, Access IP Blocked, Redundant Power Changed, Redundant Ethernet Changed, DI_1 Changed, DI_2 Changed, DI_3 Changed, DI_4 Changed, DO_1 Changed, and DO_2 Changed. Below this, there is a 'System Log Settings' section with 'Server IP' (192.168.0.33) and 'Port' (514) fields, and a button 'Using Current Host's Log Server'. At the bottom, there are three buttons: 'Refresh', 'Apply Only', and 'Apply and Save'.

Figure 5-11 Notification

The following table describes the labels in this screen.

Label	Description
SNMP Trap	To notify events by SNMP trap.
Email Notification	To notify events by Email.
Syslog Notification	To notify events by Syslog.
Notify items	Events to be notified.

Apply	Apply current setting.
Apply and Save	Apply and save current setting.

Table 5-5 Notification

Management

Figure 5-11 Management

The following table describes the labels in this screen.

Label	Description
Web Management Enable	To enable management from Web. Click " Goto Web Management " button to access web.
Telnet Management Enable	To enable management by Telnet. Click " Goto Telnet Management " button to execute Telnet command.
SNMP Management Enable	To enable management by SNMP.
SNMP Management Settings	To configure SNMP related settings.

Table 5-6 Management

Upgrade Firmware

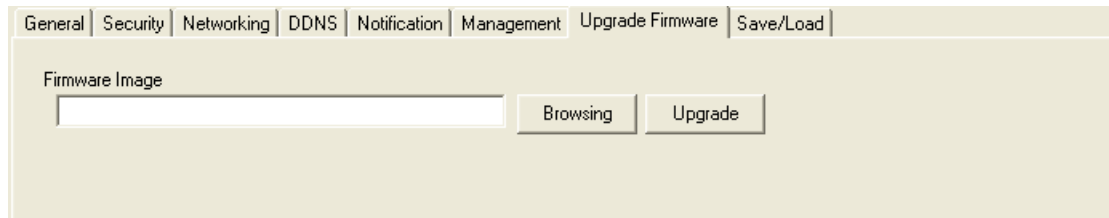


Figure 5-12 Upgrade Firmware

The following table describes the labels in this screen.

Label	Description
Browsing	Browse the file and upgrade
Upgrade	Enable the firmware upgrade.

Table 5-7 Upgrade Firmware

Save/Load

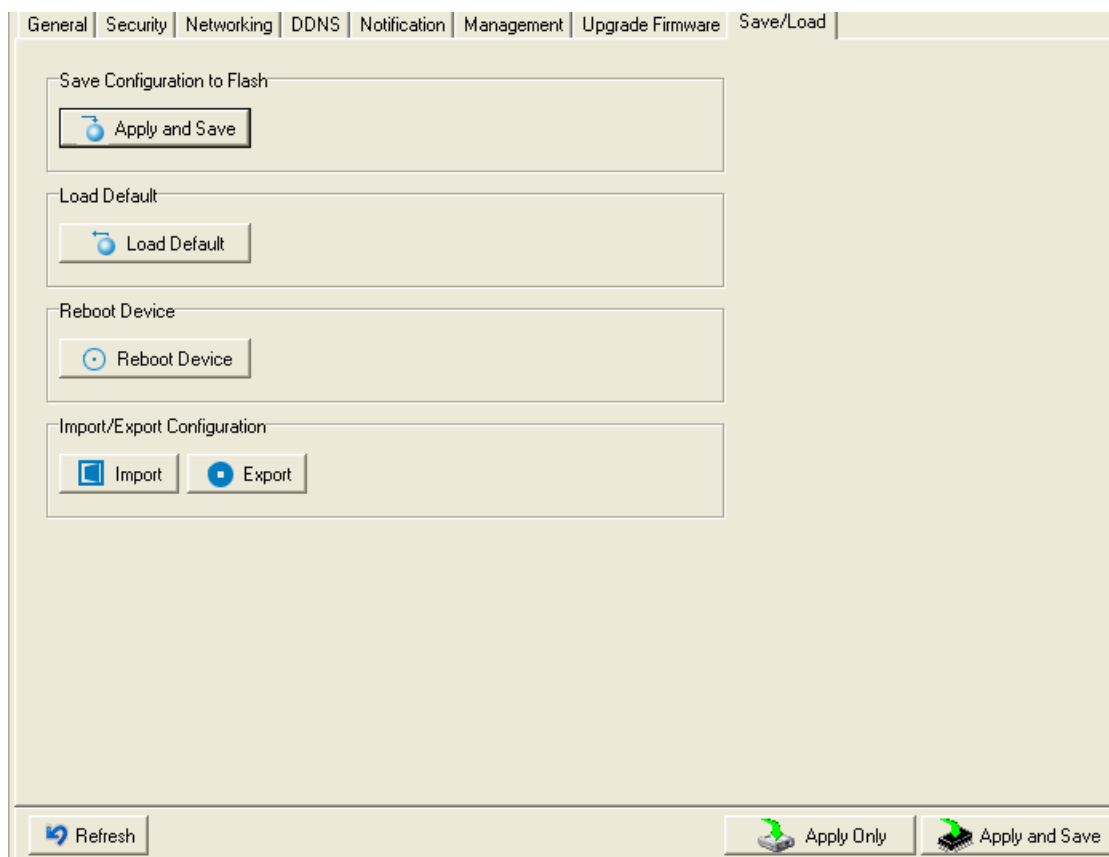


Figure 5-13 Save / Load

The following table describes the labels in this screen.

Label	Description
Save Configuration to Flash	Save current configuration into flash memory.
Load Default	Load default configuration except the network settings. If you want to load all factory default, you need to press " Reset " button on the device (Hardware restore).
Reboot Device	Reboot the device server (warm start).
Import Configuration	Restore the previous exported configuration.
Export Configuration	Exported current configuration to a file to backup the configuration.

Table 5-8 Save / Load

5.1.2.3 Configure serial port

Serial Settings

Serial Settings | Service Mode | Notification

port1

Port Alias

Baudrate

Stop Bits

Performance

Parity

Flow Control

Data Bits

Interface

Delimiter Settings

Serial to Ethernet | Ethernet to Serial

Delimiter 1

(HEX)

☐ Enabled

Delimiter 2

(HEX)

☐ Enabled

Delimiter 3

(HEX)

☐ Enabled

Delimiter 4

(HEX)

☐ Enabled

Flush Serial to Ethernet Data Buffer After

(0-65535) ms

The received data will be queueing in the buffer until all the delimiters are matched. When the buffer is full (4K Bytes) or after "flush S2E data buffer" timeout, the data will also be sent.

Force TX interval time

(0-65535) ms

data 1

interval time

data 2

interval time

data 3

The received data will be queueing in TX buffer until TX interval time is timeout or TX buffer is full (4K Bytes) , the data will also be sent. 0 is disable.

Refresh

Apply Only

Apply and Save

Figure 5-14Serial Settings

MICROSENS

The following table describes the labels in this screen.

Label	Description
Port Alias	Remark the port to hint the connected device.
Interface	RS422 / RS485(2-wires) / RS485(4-wires)
Baud rate	110bps/300bps/1200bps/2400bps/4800bps/9600bps/19200bps/ 38400bps/57600bps/115200bps/230400bps/460800bps
Data Bits	5, 6, 7, 8
Stop Bits	1, 2 (1.5)
Parity	No, Even, Odd, Mark, Space
Flow Control	No, XON/XOFF, RTS/CTS, DTR/DSR
Performance	Throughput: This mode optimized for highest transmission speed. Latency: This mode optimized for shortest response time.
Serial to Ethernet	Delimiter: You can define max. 4 delimiters (00~FF, Hex) for each way. The data will be hold until the delimiters are received or the option-"Flush Serial to Ethernet data buffer" times out. 0 means disable. Factory default is 0. Flush Data Buffer After: The received data will be queuing in the buffer until all the delimiters are matched. When the buffer is full (4K Bytes) or after "flush S2E data buffer" timeout the data will also be sent. You can set the time from 0 to 65535 seconds.
Ethernet to Serial	Delimiter: You can define max. 4 delimiters (00~FF, Hex) for each way. The data will be hold until the delimiters are received or the option "Flush Ethernet to Serial data buffer" times out. 0 means disable. Factory default is 0. Flush Data Buffer After: The received data will be queuing in the buffer until all the delimiters are matched. When the buffer is full (4K Bytes) or after "flushE2S data buffer" timeout the data will also be sent. You can set the time from 0 to 65535 seconds.

Force TX Interval Time	Force TX interval time is to specify the timeout when no data has been transmitted. When the timeout is reached or TX buffer is full (4K Bytes), the queued data will be sent. 0 means disable. Factory default value is 0.
------------------------	---

Table 5-9 Serial settings

Service Mode – Virtual COM Mode

In Virtual COM Mode, The driver establishes a transparent connection between host and serial device by mapping the Port of the serial server serial port to local COM port on the host computer. Virtual COM Mode also supports up to 5 simultaneous connections, so that multiple hosts can send or receive data by the same serial device at the same time.

The screenshot shows the 'Service Mode' configuration window for the Virtual COM Mode. The 'Virtual COM Settings' section includes a checkbox for 'Encryption with SSL', 'Data Port' set to 4000, 'Control Port' set to 4001, and a 'Map Virtual COM' button. The 'Misc.' section includes 'Idle Timeout' set to 0 seconds and 'Alive Check' set to 420 seconds. The 'Multilink' section shows 'Max Connections' set to 1 and a table for managing connections. The table has columns for 'Destination Host', 'VCOM Name', and buttons for 'Goto VCom' and 'Unmap VCom'. The first row shows 'Waiting for VCOM connect' in the VCOM Name field. At the bottom are 'Refresh', 'Apply Only', and 'Apply and Save' buttons.

Figure 5-15 Virtual COM

The following table describes the labels in this screen.

Label	Description
Encryption with SSL	Use SSL to encrypt data.
Map Virtual COM	Select a Virtual COM Name to map on.
Max Connection	The number of Max connection can support simultaneous connections are 5, default values is 1.
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.

Table 5-10 Virtual COM

**Not allowed to mapping Virtual COM from web*

Service Mode – TCP Server Mode

In TCP Server Mode, DS is configured with a unique Port combination on a TCP/IP network. In this case, DS waits passively to be contacted by the device. After a connection is established, it can then proceed with data transmission. TCP Server mode also supports up to 5 simultaneous connections, so that multiple device can receive data from the same serial device at the same time.

The screenshot shows the 'Service Mode' configuration window for the TCP Server. The 'TCP Server Mode' tab is selected. Under 'TCP Server Settings', the 'Data Port' is set to 4000 and 'Control Port' to 4001. 'Telnet Negotiation' is checked, and there is an 'Auto Scan' button. The 'Misc.' section shows 'Idle Timeout' at 0 seconds and 'Alive Check' at 40 seconds. The 'Multilink' section has 'Max Connections' set to 1 with a 'Refresh' button. Below this is a table for 'Destination Host' with 5 rows, each containing an IP address field and a 'Disconnect' button. At the bottom of the window are 'Refresh', 'Apply Only', and 'Apply and Save' buttons.

Figure 5-16 TCP Server mode

The following table describes the labels in this screen.

Label	Description
Encryption with SSL	Use SSL to encrypt data.
Data Port	Set the port number for data transmission.
Telnet Negotiation	Full Telnet command / symbol compatible
Auto Scan	Scan the data port automatically.
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.
Max Connection	The number of Max connection can support simultaneous connections are 5, default values is 1.

Table 5-11 TCP Server mode

Service Mode – TCP Client Mode

In TCP Client Mode, device can establish a TCP connection with server by the method you have settled (Startup or any character). After the data has been transferred, device can disconnect automatically from the server by using the TCP alive check time or Idle time settings.

Figure 5-17 TCP Client Mode

The following table describes the labels in this screen.

Label	Description
Encryption with SSL	Use SSL to encrypt data.
Destination Host	Set the IP address of host.
Port	Set the port number of data port.
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined

	time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.
Connect on Startup	The TCP Client will build TCP connection once the connected serial device is started.
Connect on Any Character	The TCP Client will build TCP connection once the connected serial device starts to send data.

Table 5-12 TCP Client mode

Service Mode – UDP Mode

Compared to TCP communication, UDP is faster and more efficient. In UDP mode, you can Uni-cast or Multi-cast data from the serial device server to host computers, and the serial device can also receive data from one or multiple host

The screenshot displays the 'Service Mode' configuration window. At the top, there are tabs for 'Serial Settings', 'Service Mode', and 'Notification'. The 'Service Mode' tab is active, and a dropdown menu shows 'UDP Mode' selected. Below this, the 'UDP Mode' section is expanded. It contains a 'UDP Settings' box with a 'Listening Port' field set to '4004' and an 'Auto Scan' button. Below the UDP settings is a 'Multilink' section with a table-like structure for configuring multiple links. The table has three columns: 'Destination Host Begin', 'Destination Host End', and 'Sending Port'. There are four rows, numbered 1 to 4. Row 1 is pre-filled with '192.168.0.1', '192.168.0.100', and '10000'. Rows 2, 3, and 4 are empty. Each row has an 'Auto Scan' button to its right.

	Destination Host Begin	to	Destination Host End	Sending Port	Auto Scan
1	192.168.0.1		192.168.0.100	10000	[Auto Scan]
2					[Auto Scan]
3					[Auto Scan]
4					[Auto Scan]

Figure 5-18 UDP mode

Notification

Specify the events that should be noticed. The events can be noticed by E-mail, SNMP trap or system log.

Figure 5-19 Notification

The following table describes the labels in this screen.

Label	Description
DCD changed	When DCD (Data Carrier Detect) signal changes, it indicates that the modem connection status has changed. Notification will be sent.
DSR changed	When DSR (Data Set Ready) signal changes, it indicates that the data communication equipment is powered off. A Notification will be sent.
RI changed	When RI (Ring Indicator) signal changes, it indicates that the incoming of a call. A Notification will be sent.
CTS changed	When CTS (Clear To Send) signal changes, it indicates that the transmission between computer and DCE can proceed. A notification will be sent.
Port connected	In TCP Server Mode, when the device accepts an incoming TCP connection, this event will be trigger. In TCP Client Mode, when the device has connected to the remote host, this event will be trigger. In Virtual COM Mode, Virtual COM is ready to use. A notification will be sent.

Port disconnected	In TCP Server/Client Mode, when the device lost the TCP link, this event will be trigger. In Virtual COM Mode, When Virtual COM is not available, this event will be trigger. A notification will be sent.
-------------------	--

Table 5-13 Notification

5.2 Configuration by Web Browser

5.2.1 CONNECT TO THE WEB PAGE

Step 1: Input the IP address of DS with "**https://192.168.16.1**" in the Address input box of IE.

Step 2: Click "**Yes**" button on the dialog box.



Figure 5-20 Certificate

Step 3: Input the name and password, then click "**OK**".



Figure 5-21 Certificate

**Only if password is set.*

Step 4: The system information will be shown as below.



Figure 5-21 System information

5.2.1.1 System

Time (SNTP)

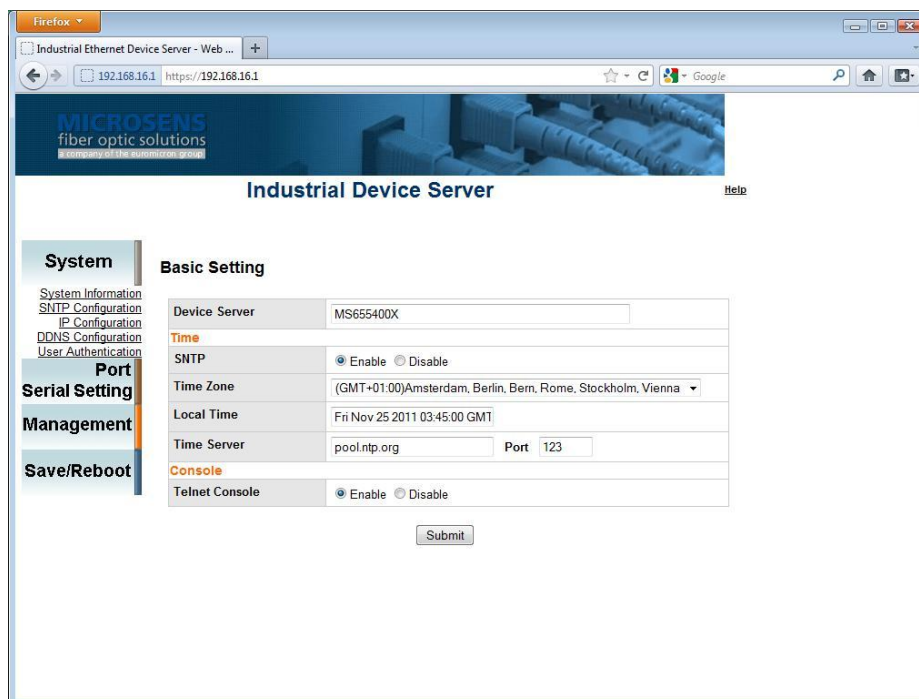


Figure 5-22 Time (SNTP)

The following table describes the labels in this screen.

Label	Description
Name	You can set the name of DS.
SNTP	Enable the SNTP server.
Time zone	After you set the SNTP enable, select the time zone you located.
Time server	Input SNTP server domain name or IP address and Port.
Console	Telnet Console (SSH) is included for security reasons. In some cases, you may need to disable this function to prevent unauthorized access from internet. The factory default is enable.

Table 5-14 Time (SNTP)

IP Configuration

You must assign a valid IP address for DS before attached in your network environment. Your network administrator should provide you with the IP address and related settings. The IP address must be unique and within the network (otherwise, DS will not have a valid connection to the network). You can choose from three possible "**IP configuration**" modes: Static, DHCP/BOOTP. The Factory Default IP address is "**192.168.16.1**"

The screenshot shows a web browser window displaying the 'Industrial Device Server' configuration page. The page has a sidebar with navigation links: System, Port, Serial Setting, Management, and Save/Reboot. The 'System' section is expanded, showing 'IP Configuration' as the active tab. The main content area contains the following fields:

- IP Configuration:** A dropdown menu set to 'Static'.
- IP Address:** A text box containing '192.168.16.1'.
- Netmask:** A text box containing '255.255.255.0'.
- Gateway:** A text box containing '192.168.16.254'.
- DNS Server 1:** A text box containing '192.168.16.254'.
- DNS Server 2:** An empty text box.
- Auto IP Report:** A section with three sub-fields:
 - Auto Report to IP:** An empty text box.
 - Auto Report to TCP Port:** A text box containing '0'.
 - Auto Report Interval:** A text box containing '0' with the unit 'seconds'.
- Ethernet Mode:** A section with two radio buttons: 'Redundant' (selected) and 'Switch'.

An 'Apply' button is located at the bottom right of the configuration area.

Figure 5-23 IP configuration

The following table describes the labels in this screen.

Label	Description
DHCP/BOOTP	Obtain the IP address automatically from DHCP server.
Static IP Address	Assigning an IP address manually.
Subnet Mask	Set the subnet mask to communicate on the network.
Gateway	Enter the IP address of the router in you network.
DNS Server	Enter the IP address of the DNS server to translate domain names into IP address.
Auto IP Report	The device server will report its status periodically. At VCOM->IP collection option show the device server status. The report interval is 0 indicate disable this setting (default). But you can set the other IP or Port.
Switch Mode	Redundant: When the connection between master-link and LAN fails, the DS can automatically switch to another LAN port within10mS, and still guarantees a non-stop connection Switch: Daisy Chain support to reduce usage of switch ports.

Table 5-15 IP configuration

PPPoE setting

PPPoE (Point-to-Point Protocol over Ethernet), Device can use PPPoE mode to connect the Network. Input the **"username"** and "Password", then click **"Connect"** button. If the device has been connected, the **"Status"** will become the **"Link up"** and device will get an IP address from PPPoE server. Click "Return" button, return the **"IP Configuration"** default page.

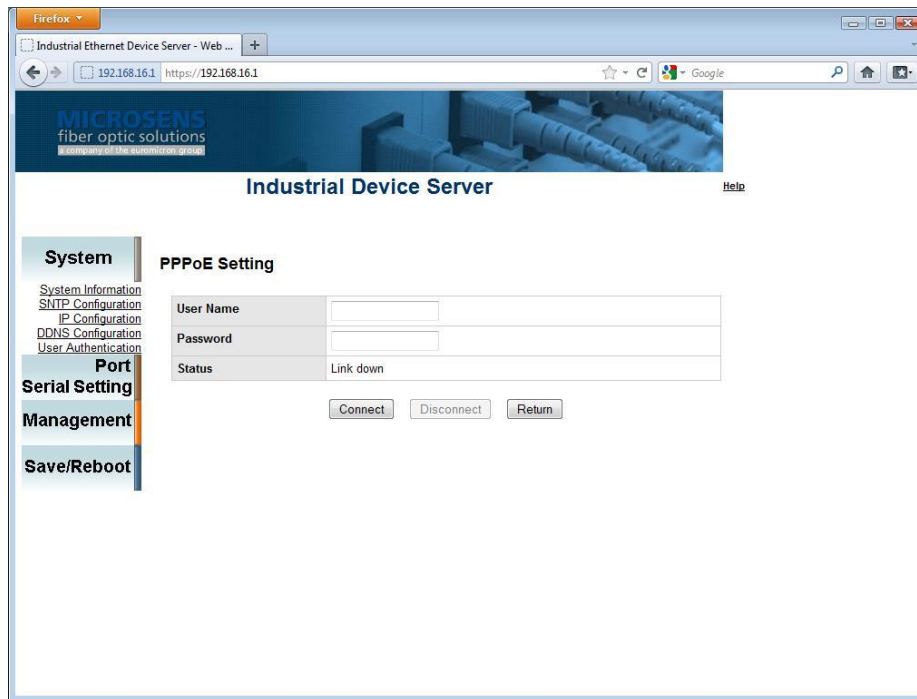


Figure 5-24 PPPoE setting.

DDNS Configuration

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname, allowing your computer to be more easily accessed from various locations on the Internet.

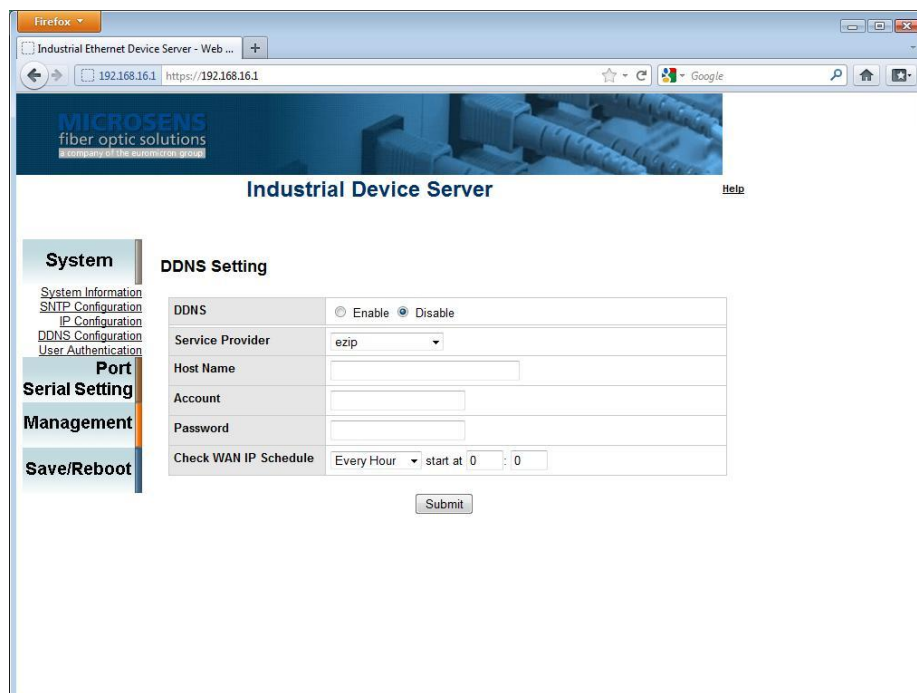


Figure 5-26 DDNS setting

The following table describes the labels in this screen.

Label	Description
Service Provider	Choose the DDNS service Provider
Hostname	You must first apply an account from the DDNS service Provider such as www.dyndns.org, then register with the dynamic DNS service. Input the fixed hostname you got from the DDNS service.
Account and Password	Input the Account and Password you have registered from the DDNS service Provider.
Check WAN IP Schedule	Device will check the IP address Status at interval time you set.

Table 5-16 DDNS Setting

Authentication

You can set the password to prevent unauthorized access from network. Input the “**Old password**” and “**New password**” to change the password. Factory default is no password.

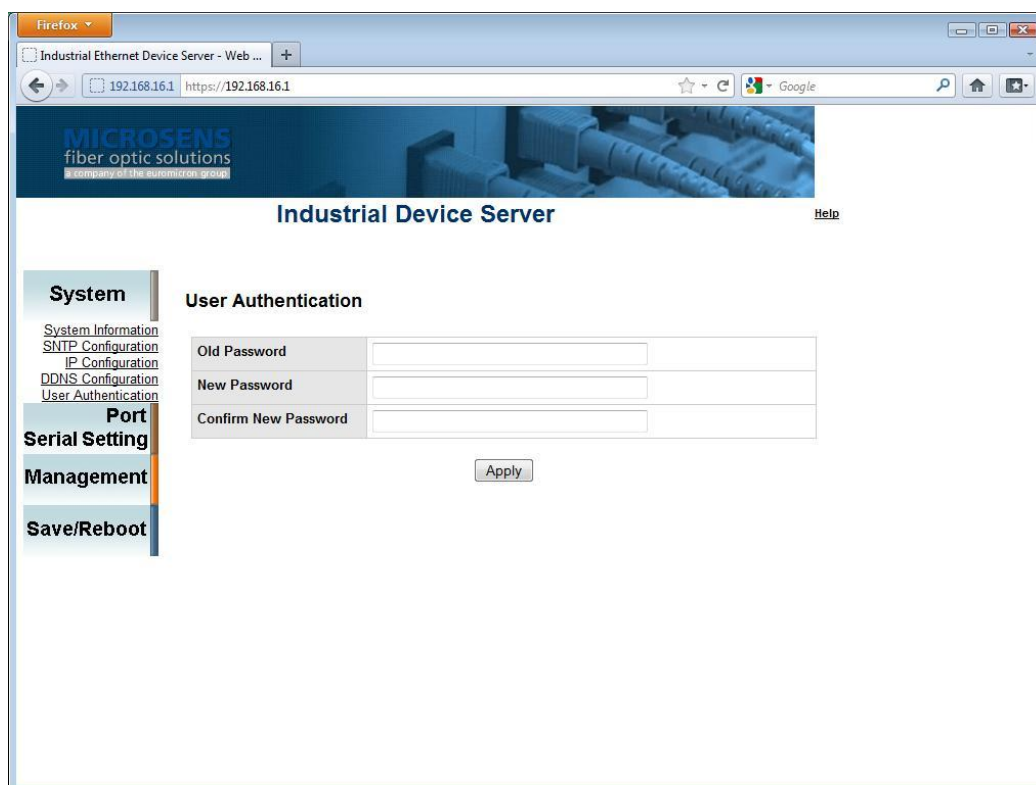


Figure 5-27 Authentication

5.2.1.2 Port serial setting

Serial configuration

Industrial Ethernet Device Server - Web ...

192.168.16.1 https://192.168.16.1

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a company of the eummicron group

Industrial Device Server [Help](#)

System

Port

Serial Setting

Serial Configuration

Port Profile

Service Mode

Management

Save/Reboot

Serial Configuration

	Port1
Port Alias	Port0
Interface	RS232
Baud Rate	38400
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None
Force TX Interval Time	0 ms
Performance	☒ Throughput ☐ Latency

Figure 5-28 Serial configuration

The following table describes the labels in this screen.

Label	Description
Port Alias	Remark the port to hint the connected device.
Interface	RS422 / RS485(2-wires) / RS485(4-wires)
Baud rate	110bps/300bps/1200bps/2400bps/4800bps/9600bps/19200bps/ 38400bps/57600bps/115200bps/230400bps/460800bps
Data Bits	5, 6, 7, 8
Stop Bits	1, 2 (1.5)
Parity	No, Even, Odd, Mark, Space
Flow Control	No, XON/XOFF, RTS/CTS, DTR/DSR

Force TX Interval Time	Force TX interval time is to specify the timeout when no data has been transmitted. When the timeout is reached or TX buffer is full (4K Bytes), the queued data will be sent. 0 means disable. Factory default value is 0.
Performance	Throughput: This mode optimized for highest transmission speed. Latency: This mode optimized for shortest response time.
Apply	Activate settings on this page.

Table 5-18 Serial configuration

Port Profile

The screenshot shows the 'Port Profile' configuration page for the 'Industrial Device Server'. The browser address bar shows 'https://192.168.16.1'. The page has a sidebar with navigation links: System, Port, Serial Setting, Management, and Save/Reboot. The 'Port' section is selected, showing 'Port1' configuration. The settings are as follows:

Port	Port1
Local TCP Port	4000
Command Port	4001
Mode	Serial to Ethernet
Flush Data Buffer After	0 ms
Delimiter(Hex 0-ff)	1: 00 2: 00 3: 00 4: 00
Mode	Ethernet to Serial
Flush Data Buffer After	0 ms
Delimiter(Hex 0-ff)	1: 00 2: 00 3: 00 4: 00

An 'Apply' button is located at the bottom of the configuration area.

Figure 5-29 Port Profile

The following table describes the labels in this screen.

Label	Description
Serial to Ethernet	Flush Data Buffer After: The received data will be queued in the buffer until all the delimiters are matched. When the buffer is full (4K Bytes) or after "flush S2E data buffer" timeout, the data will also be sent. You can set the time from 0 to 65535 seconds. Delimiter: You can define max. 4 delimiters (00~FF, Hex) for each way. The data will be hold until the delimiters are received or the option "Flush Serial to Ethernet data buffer" times out. 0 means disable. Factory default is 0
Ethernet to serial	Flush Data Buffer After: The received data will be queued in the buffer until all the delimiters are matched. When the buffer is full (4K Bytes) or after "flush E2S data buffer" timeout, the data will also be sent. You can set the time from 0 to 65535 seconds. Delimiter: You can define max. 4 delimiters (00~FF, Hex) for each way. The data will be hold until the delimiters are received or the option "Flush Ethernet to Serial data buffer" times out. 0 means disable. Factory default is 0

Table 5-18 Port Profile

Service Mode – Virtual COM Mode

In Virtual COM Mode, the driver establishes a transparent connection between host and serial device by mapping the Port of the serial server serial port to local COM port on the host computer. Virtual COM Mode also supports up to 5 simultaneous connections, so that multiple hosts can send or receive data by the same serial device at the same time.



Figure 5-30 Virtual COM mode

The following table describes the labels in this screen.

Label	Description
Data Encryption	Use SSL to encrypt data.
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.
Max Connection	The number of Max connection can support simultaneous connections are 5, default values is 1.

Table 5-19 Virtual COM mode

**Not allowed to mapping Virtual COM from web*

Service Mode – TCP Server Mode

In TCP Server Mode, DS is configured with a unique Port combination on a TCP/IP network. In this case, DS waits passively to be contacted by the device. After the device establishes a connection with the serial device, it can then proceed with data transmission. TCP Server mode also supports up to 5 simultaneous connections, so that multiple device can receive data from the same serial device at the same time.

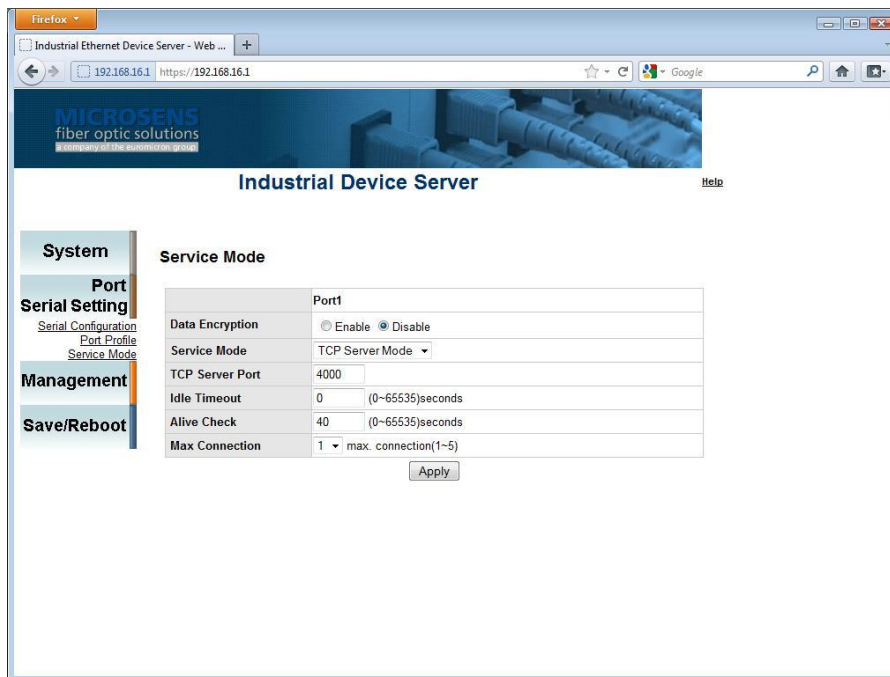


Figure 5-31 TCP Server Mode

The following table describes the labels in this screen.

Label	Description
Data Encryption	Use SSL to encrypt data.
Telnet Negotiation	Full Telnet command / symbol compatible
TCP Server Port	Set the port number for data transmission.
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined time

	interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.
Max Connection	The number of Max connection can support simultaneous connections are 5, default values is 1.

Table 5-20 TCP server mode

Service Mode – TCP Client Mode

In TCP Client Mode, device can establish a TCP connection with server by the method you set (Startup or any character). After the data has been transferred, device can disconnect automatically from the server by using the TCP alive check time or Idle timeout settings.

The screenshot shows a web browser window titled "Industrial Ethernet Device Server - Web ...". The address bar shows "192.168.16.1" and "https://192.168.16.1". The page header includes the MICROSENS logo and "fiber optic solutions". The main title is "Industrial Device Server". On the left, there is a navigation menu with "System", "Port Serial Setting", "Management", and "Save/Reboot". The "Port Serial Setting" section is expanded, showing "Serial Configuration", "Port Profile", and "Service Mode". The "Service Mode" section is active, displaying the following settings:

- Port1**: (empty)
- Data Encryption**: ☐ Enable ☒ Disable
- Service Mode**: TCP Client Mode (dropdown)
- Destination Host**: (empty) : 4000
- Idle Timeout**: 0 (0~65535)seconds
- Alive Check**: 40 (0~65535)seconds
- Connect on**: ☒ Startup ☐ Any Character
- Destination Host** and **Port** table:

Destination Host	Port
1. (empty)	65535
2. (empty)	65535
3. (empty)	65535
4. (empty)	65535

An "Apply" button is located at the bottom of the settings area.

Figure 5-32 TCP client mode

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The following table describes the labels in this screen.

Label	Description
Data Encryption	Use SSL to encrypt data.
Destination Host	Set the IP address of host and the port number of data port. .
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.
Connect on Startup	The TCP Client will build TCP connection once the connected serial device is started.
Connect on Any Character	The TCP Client will build TCP connection once the connected serial device starts to send data.

Table 5-21 TCP client mode

Service Mode – UDP Client Mode

Compared to TCP communication, UDP is faster and more efficient. In UDP mode, you can Uni-cast or Multi-cast data from the serial device server to host computers, and the serial device can also receive data from one or multiple host



Figure 5-33 UDP client mode

5.2.1.3 Management

Access IP Control

Access IP Control Settings allow you to add or block the remote host IP addresses to prevent unauthorized access. If host's IP address is in the accessible IP table, then the host will be allowed to access the DS. You can choose one of the following cases by setting the parameter.

1. Only one host with a special IP address can access the device server, "**IP address /255.255.255.255**" (e.g., "**192.168.0.1/255.255.255.255**").

2. Hosts on a specific subnet can access the device server. "**IP address/255.255.255.0**" (e.g., "**192.168.0.2/255.255.255.0**")
3. Any host can access the device server. Disable this function by un-checking the "**Enable IP Filter**" checkbox

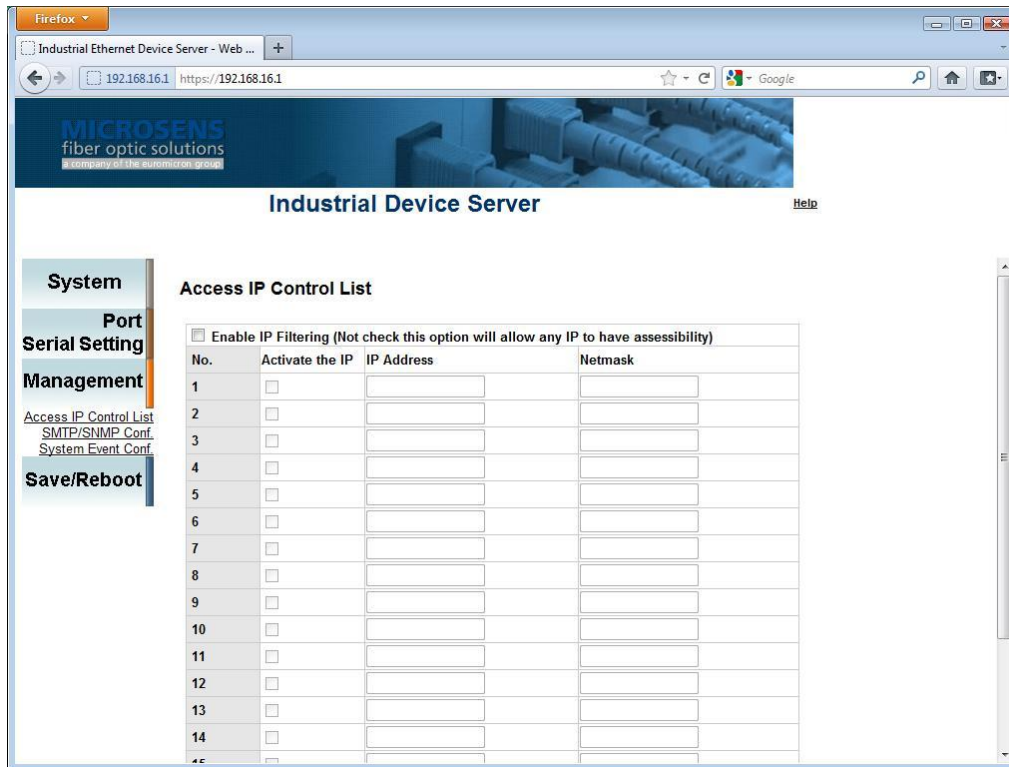


Figure 5-34 Access IP

SMTP/SNMP Conf

Email Server configuration includes the mail server's IP address or domain. If the authentication is required, specify your name and password. There are 4 Email addresses that you can specify to receive the notification.

SNMP Server configuration includes the SNMP Trap Server IP address, Community, Location and Contact. There are 4 SNMP addresses you can specify to receive the notification.

SysLog server configuration includes the server IP and server Port. This option need to use with VCOM.

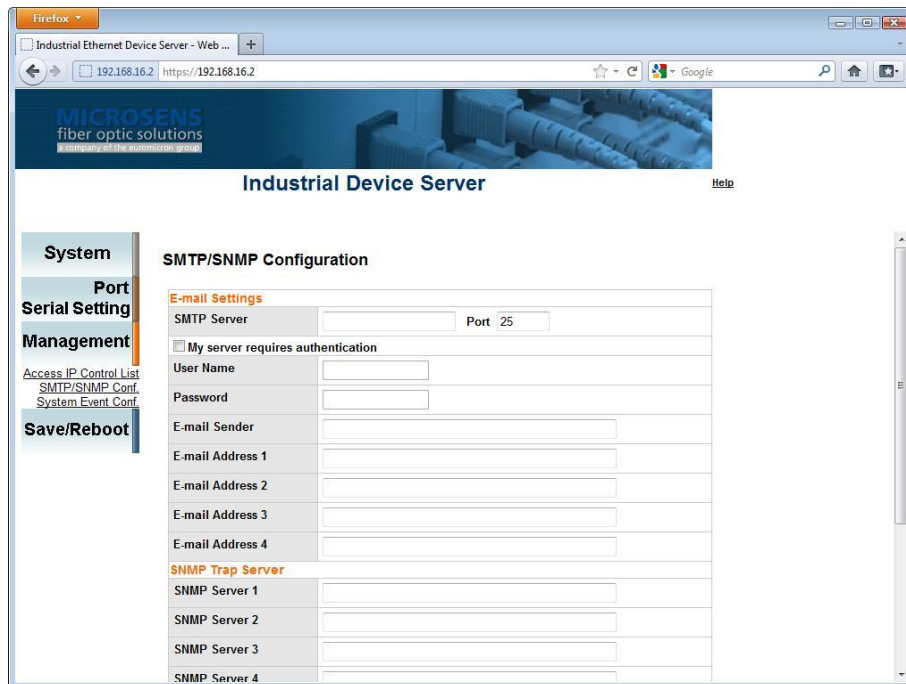


Figure 5-35 SMTP / SNMP conf

System Event Conf.

Specify the events that should be notified to the administrator. The events can be alarmed by E-mail, SNMP trap, or system log.

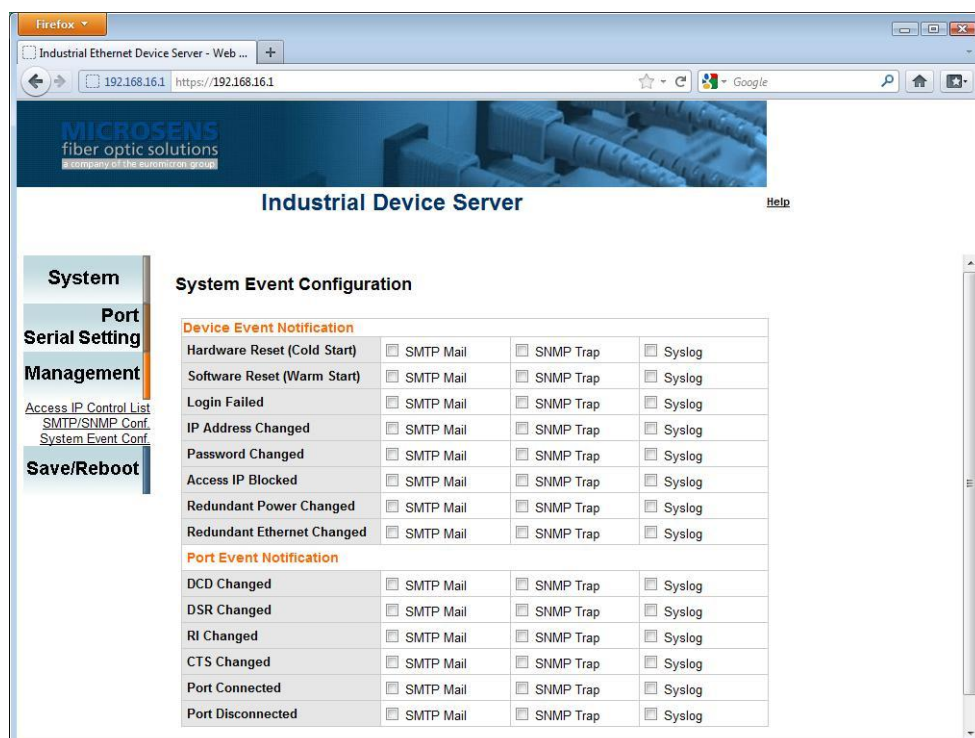


Figure 5-36 SMTP / SNMP conf

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The following table describes the labels in this screen.

Label	Description
Hardware Reset (Cold Start)	This refers to starting the system from power off (contrast this with warm start). When performing a cold start, DS will automatically issue an Auto warning message by sending E-mail, log information or an SNMP trap after booting.
Software Reset (Warm Start)	This refers to restart the computer without turning the power off. When performing a warm start, DS will automatically send an E-mail, log information or SNMP trap after reboot.
Login Failed	When an unauthorized access from the Console or Web interface, a notification will be sent.
IP Address Changed	When IP address of device changed, a notification will be sent.
Password Changed	When password of device changed, a notification will be sent.
Access IP Blocked	When the host accesses the device with blocked IP addresses, a notification will be sent.
Redundant Power Change	When status of power changed, a notification will be sent.
Redundant Ethernet Change	When status of Ethernet port changed, a notification will be sent.
DCD changed	When DCD (Data Carrier Detect) signal changes, it indicates that the modem connection status has been changed. A Notification will be sent.
DSR changed	When DSR (Data Set Ready) signal changes, it indicates that the data communication equipment is powered off. A Notification will be sent.
RI changed	When RI (Ring Indicator) signal changes, it indicates an incoming call. Notification will be sent.
CTS changed	When CTS (Clear To Send) signal changes, it indicates that the transmission between computer and DCE can proceed. A notification will be sent.
Port connected	In TCP Server Mode, when the device accepts an incoming TCP connection, this event will be trigger. In TCP Client Mode, when the device has connected to the remote host, this event will be trigger. In Virtual COM Mode, Virtual COM is ready to use. A notification will be sent.
Port disconnected	In TCP Server/Client Mode, when the device lost the TCP link, this event will be trigger. In Virtual COM Mode, When Virtual COM is not available, this event will be trigger. A notification will be sent.

Table 5-22 System event conf

5.2.1.4 Save/Reboot

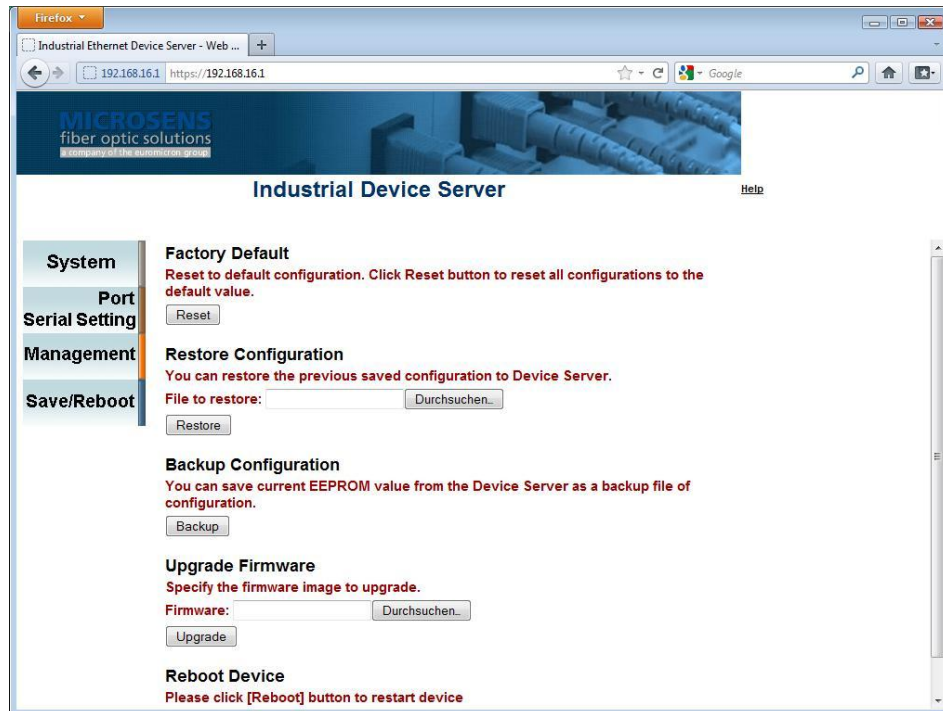


Figure 5-37 Save / Reboot

The following table describes the labels in this screen.

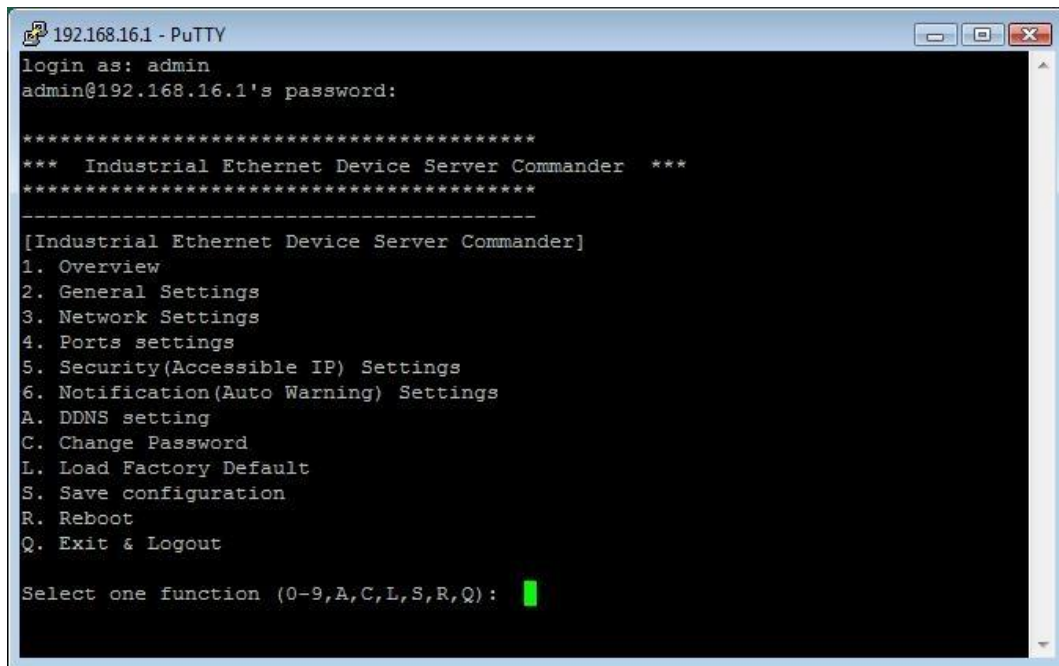
Label	Description
Factory Default	Load default configuration except settings of Network. If you want load all factory default, you should press " Reset " button about the five seconds on the device (Hardware restore).
Restore Configuration	Restore the previous exported configuration.
Backup Configuration	Export the current configuration to a file.
Upgrade Firmware	Upgrade to a new firmware with specified file.
Reboot Device	Reboot the device server (warm start).

Table 5-23 Save / Reboot

5.3 Configuration by SSH Console

5.3.1 Connect to DS

You can use SSH Tool (e.g., PUTTY) to access SSH console of DS. The SSH console interface is shown below. (Default username and password are admin)



```
192.168.16.1 - PuTTY
login as: admin
admin@192.168.16.1's password:

*****
***  Industrial Ethernet Device Server Commander  ***
*****
-----
[Industrial Ethernet Device Server Commander]
1. Overview
2. General Settings
3. Network Settings
4. Ports settings
5. Security(Accessible IP) Settings
6. Notification(Auto Warning) Settings
A. DDNS setting
C. Change Password
L. Load Factory Default
S. Save configuration
R. Reboot
Q. Exit & Logout

Select one function (0-9,A,C,L,S,R,Q):
```

Figure 5-38 SSH

Technical Specifications

Network Interface	
Ethernet	2x 10/100Base-T(X) which support Redundant Dual Ethernet or Switch Mode support. Auto-recover less than 10ms
connector	RJ-45
Protection	Built-in 1.5KV magnetic isolation
Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, ARP/RARP, DNS, SNMP MIB II, HTTPS, SSH
Serial Interface	
Interface	1x RS232 / RS422 / 4(2)-Wire RS485. Which can be configured by VCOM
Connector	Male DB9
Serial Baud Rate	110 bps to 460.8 Kbps
Data Bits	5, 6, 7, 8
Parity	odd, even, none, mark, space
Stop Bits	1, 1.5, 2
RS-232 signals	TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
RS-422 signals	Tx+, Tx-, Rx+, Rx-, GND
RS-485 (4 wire) signals	Tx+, Tx-, Rx+, Rx-, GND
RS-485 (2 wire) signals	Data+, Data-, GND
Flow control	XON/XOFF, RTS/CTS, DTR/DSR
Serial Line Protection	Built-in 15KV ESD protection
LED Indicators	PWR (1)(2) / Ready: 1) Red On: Power is on and booting up. Red Blinking: Indicates an IP conflict, or DHCP or BOOTP server did not respond properly. 2) Green On: Power is on and functioning normally. Green Blinking: Located by Administrator. ETH1(2) Link / ACT: Amber ON/Blinking: 10 Mbps Ethernet

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	Green ON/Blinking: 100 Mbps Ethernet Serial TX / RX LEDs: Red: Serial port is receiving data Green: Serial port is transmitting data.
Power Requirements	
Power Input	PWR1: 12 ~ 48VDC in 3-pin Terminal Block PWR2: 12 ~ 48VDC in power jack
Reverse Polarity Protection	Present at terminal block
Power Consumption	4 Watts MAX
Software Utility	
Utility	VCOM for Windows NT/2000/XP/ 2003/VISTA which include Device discovery Auto IP report Device setting (run-time change, no rebooting) Access control list Group setting Device monitoring Serial port monitoring Log info Group Firmware update
Serial Mode	Virtual Com / TCP Server / TCP Client / UDP / Serial Tunnel TCP Alive Check Timeout Inactivity Timeout Delimiter for Data Packing Force TX Timeout for Data Packing
Multiple Link	5 Hosts simultaneous connection: Virtual Com / TCP server / TCP Client / UDP
VCOM Driver	Windows NT/2000/XP/2003/VISTA
Configuration	Web HTTPS console, SSH console, VCOM for Windows NT/2000/XP/VISTA
Environmental	
Operating Temperature	-10 to 60°C (14 to 140°F)
Operating Humidity	5% to 95%(Non-condensing)
Storage Temperature	-40 to 85°C (-40 to 185°F)

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Mechanical	
Dimensions(W x D x H)	72mm(W)x125mm(D)x31mm(H)
Casing	IP-30 protection
Regulatory Approvals	
Shock	IEC 60068-2-27
Free Fall	IEC 60068-2-32
Vibration	IEC 60068-2-6
EMI	CISPR (EN55022) class A
EMS	EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge) EN61000-4-6 (CS)